

## CLAIMS

What is claimed is:

1. In a system that comprises a gateway that interfaces to an Internet service provider or corporate network, a local area network edge device, a satellite that provides a communication link between the gateway and the local area network edge device, and one or more personal computers coupled by way of a network to the local area network edge device, a dynamic resource allocation system that supports differentiated services with different levels of priority, comprising:
  - an Internet protocol network that comprises:
    - a classifier for identifying specific types of messages; and
    - a dynamic assignment/multiple access (DAMA) communication protocol for transmitting data over the system.
2. The dynamic resource allocation system recited in Claim 1 wherein the satellite is a non-processing satellite.
3. The dynamic resource allocation system recited in Claim 2 wherein the non-processing satellite implements a bent pipe communications link between the local area network edge device and the gateway.
4. The dynamic resource allocation system recited in Claim 1 wherein the satellite is a processing satellite comprising an onboard resource management element.
5. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises an application detection algorithm.
6. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a resource requirement estimation algorithm that is based on queue statistics versus performance statistics.
7. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a resource request that generates a resource request to set required resources.

8. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a resource request that sends raw queue statistics to the gateway to set required resources.

9. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a weighted fair queuing algorithm that performs a weighted fair queuing that drains the queues while effectively utilizing the gateway assigned resources.

10. The dynamic resource allocation system recited in Claim 1 wherein the gateway comprises an algorithm that accumulates all requests received at substantially the same time.

11. The dynamic resource allocation system recited in Claim 1 wherein the gateway comprises an algorithm that functions to assign each edge device a time and frequency resources based upon services classes and consumer profile for each current and previous request.

12. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises three modes, including fixed assignment, reservation assignment, and random assignment modes.

13. The dynamic resource allocation system recited in Claim 12 wherein, in the fixed assignment mode, a certain amount of bandwidth is allocated for the highest priority users.

14. The dynamic resource allocation system recited in Claim 12 wherein, in the reservation assignment mode, reservation bandwidth is allocated for users to request their demand without knowledge of others request transmissions.

15. The dynamic resource allocation system recited in Claim 12 wherein, in the random access mode, users transmit the data without making reservations.

16. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a collision resolution algorithm.

17. The dynamic resource allocation system recited in Claim 12 wherein the boundary between the random access mode and the reservation mode is movable in order to reduce the number of collisions whenever there are more best effort users using the system.

18. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a bandwidth request algorithm, a connection acceptance algorithm, a bandwidth usage detection algorithm, and a resource assignment algorithm.

19. The dynamic resource allocation system recited in Claim 1 wherein the DAMA communication protocol comprises a bandwidth request algorithm, a connection acceptance algorithm, a bandwidth usage detection algorithm, and a resource assignment algorithm.